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(Article begins on next page)

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# Is a good example the best sermon? Children's imitation of parental reading

Anna Laura Mancini, Chiara Monfardini, Silvia Pasqua

## Abstract

We use the last two waves of the Italian Time Use Survey to analyse whether children imitate the reading habits of their parents. As reading is crucial for continuous investment in human capital throughout a person's life, it is important that children acquire the habit of reading. This habit may be developed through both cultural and educational transfers from parents to children, and through imitative behaviours. Imitation is of particular interest, as it suggests that parents can have a direct influence on the formation of their children's preferences and habits, and that active policies promoting good parenting behaviours might therefore be desirable. We investigate the short-run imitative behaviour of children using a household fixed-effects model in which we identify the impact of the parents' role model by exploiting the differences in the exposure of siblings to their parents' example within the same household. We find robust evidence of the existence of an imitation effect: on the day of the survey, children were more likely to have read after seeing either their mother or their father reading.

## Keywords

Parental role model Imitation Intergenerational transmission Household fixed effects

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## JEL Classification

J13 J22 J24 C21

## 1 Introduction

Reading is a crucial activity in the process of human capital accumulation, as it is positively linked to educational outcomes and subsequent earnings (Connolly et al. 1992). Cunningham and Stanovich (2001) have shown that reading has accumulated effects over time, with profound implications for the development of a wide range of cognitive abilities, verbal skills, and declarative knowledge. Similarly, Stanovich (1986) emphasised the role of reading in increasing the efficiency of the cognitive process. In light of these benefits, educators and policy makers have been looking for ways to encourage young people to read. Research suggests that parents often transmit their preferences and habits to their children, and can thus act as role models in promoting reading (Mullan 2010).

In this paper, we look at whether children imitate their parents' reading activity. Imitation is an important channel for the intergenerational transmission of habits. It is widely assumed that parents directly influence the formation of children's preferences by serving as role models. This suggests that active policies aimed at promoting good parenting behaviour could affect the reading habits of children. Clearly, the intergenerational transmission of attitudes towards reading occurs not only through imitative behaviours, but also through cultural and educational transmission from parents to children. While parents who wish to encourage their children to read can do so by reading to their children when they are very young (as in Kalb and van Ours 2014), teaching them the importance of reading, and providing them with books, Teale and Sulzby (1986) have found that adults' reading habits also influence the reading habits of children. Studies on habit formation (Neal et al. 2006; Wood and Neal 2007) have shown that a large share of everyday actions are characterised by habitual repetition. Therefore, when parents read in the presence of their children, the children may develop the habit of reading through imitation. While reading is clearly not the only activity that builds human capital, the early acquisition of reading skills appears to facilitate the development of a lifetime habit of reading (Cunningham and Stanovich 1997), and therefore seems to have long-term and multiplying effects.

Our analysis relies on the Italian Time Use Survey (2002–2003 and 2008–2009 pooled waves) conducted by ISTAT. While most Time Use Surveys collect data from only one member of each household, and rarely include children of primary school age, the Italian dataset provides detailed information on the time devoted to reading by both parents and their children, including when, with whom, and in the presence of whom the activity is performed. The availability of this information allows us to investigate whether children are more likely to allocate time to reading if they observed their parents engaged in this activity on the same day. We are able to examine the time children aged 6–15 devoted to reading on their own. As the dataset also includes information on a large number of siblings, we can identify the imitation effect using a family fixed-effects approach. We do so by exploiting the variation that occurs among siblings: different children, for exogenous reasons, may have been exposed differently to their parents' reading activities on the survey day. This within-family variation allows us to isolate the causal effect of imitation from the effects of the household environment and education provided by the parents, which would have been experienced by all of the children in the household. Our identification strategy is validated by a number of robustness checks, which prove that the relationship and witnessing one or both of their parents reading is neither spurious nor mechanical.

We find new and clear-cut evidence of the existence of an imitation effect, which confirms the truth of the adage that “a good example is the best sermon”. On the day of the survey, the probability that children spent time reading increased significantly after they saw their parents reading. We look separately at mothers and fathers, since past research has shown that individual parents can affect their children's decisions and behaviour differently.<sup>1</sup> The probability that the child spent time reading increased from about 4 % to about

34 % when the mother was observed reading. The imitation effect for fathers was similar, raising the probability that a child spent time reading from about 5 % to about 36 %.

Our research sheds new light on the mechanisms of intergenerational transmission of preferences and attitudes that are essential for targeting human capital accumulation policies.

Are parents able to influence their children's preferences and choices through their behaviour? Can we assume that policies targeted at adults also have effects on members of the next generation, and are therefore more productive? Our findings suggest that role modelling by parents is one important channel through which parental time use may affect children's behaviour and time allocation decisions, and thus future child outcomes.

The paper is organised as follows. Section 2 presents a review of the main literature. Section 3 describes the dataset used and the sample selection made for our empirical analysis. Section 4 presents the empirical strategy. The results and robustness checks are discussed in Sect. 5. Section 6 concludes.

## **2 Background literature**

There is a vast literature on intergenerational transmission, but few studies have focused on the mechanisms of the transmission, especially those involving behavioural patterns, habits, and attitudes. The existing research on intergenerational transmission has mainly examined the transmission of education and income, or has analysed the transmission of cognitive abilities, and shown that the positive correlation between parents and children is the result of both “nature” (genetic endowment) and “nurture”; i.e., that better educated parents invest more in their children's education (for a complete review, see Black and Devereux 2011). The transmission of cognitive abilities from parents to children has been investigated to a lesser extent. Brown et al. (2010) for the UK and Anger and Heineck (2010) for Germany looked at correlations in test scores, and found a strong transmission effect that is largely explained by the investments parents make in their children (see also Sénéchal and LeFevre 2002).

However, the transmission of preferences, habits, and attitudes also appears to be relevant. In 1976, Robert Pollak argued that preferences, especially in the short run, are influenced by other people's past consumption behaviour: i.e., that individuals tend to consume a given good after observing other people around them consuming that good. Waldkirch et al. (2004) analysed the transmission of consumption preferences and behaviour, while Booth and Kee (2009) and Blau et al. (2013) examined the intergenerational cultural transmission of norms regarding fertility. Jackson et al. (1997) and Loureiro et al. (2006) explored whether smoking habits were passed on from parents to children. Meanwhile, Lindbeck and Nyberg (2006) looked at the intergenerational transmission of norms related to hard work, Wilhelm et al. (2008) studied the intergenerational transmission of generosity, and Dohmen et al. (2012) examined the transmission of risk and

trust attitudes. All these analyses found that parents influence their children's preferences through role modelling, educational choices, and behaviour.

The body of literature on the intergenerational transmission of time use preferences and time allocation is much smaller, and has tended to focus more on labour supply (Del Boca et al. 2000; Fernández et al. 2004; Kawaguchi and Miyazaki 2009; Blau et al. 2013) and on the amount of time spent on domestic work (Alvarez and Miles 2008). Only Mullan (2010) and Cardoso et al. (2010) have studied the time parents and children allocate to activities associated with human capital accumulation. In particular, Mullan (2010), using a time use dataset for the UK, found a positive correlation between the time spent reading by parents and children aged 13–18. Cardoso et al. (2010) investigated the relationship between the time allocations of parents and children in France, Germany, and Italy. In their paper, they used the Multinational Time Use Study to examine how adolescents aged 15–19 allocate their time among three different activities (reading and studying, socialising, and watching TV), and how their choices are affected by their parents' time use decisions. However, none of these studies focused on the mechanisms of intergenerational transmission, or were able to discern an imitation effect. According to the *social learning theory* of Bandura (1977), a variety of behavioural patterns are learned primarily through a process of observation that seems to be the most essential form of learning through which a variety of behavioural patterns are acquired (Bandura and Walters 1963). Thus, parents appear to serve as a (unintentional) model for their children. In their analysis of the intergenerational transmission of book reading and television viewing behaviour, Notten et al. (2012) attempted to distinguish between the effects of imitation, parental guidance, and cultural transmission channels. They found that parents set a specific reading or TV viewing example that children tend to imitate, and that this socialisation effect remains influential for the rest of the children's lives. However, the Dutch data they used are not well-suited for determining the imitation effect, as they are based on retrospective questions about the past and present media experiences of a sample of adult individuals.

By considering children aged 6–15, we extend Cardoso et al.'s (2010) analysis to younger children. The inclusion of young children is particularly relevant in light of recent theories and results on the importance of early investment in children (Cunha and Heckman 2007). The Italian dataset is one of the few time use datasets which provide a time diary for children older than three. Furthermore, our dataset allows us to study which activities both parents and children engaged in on the selected day, where they performed these activities, and which family members were present. Compared to the harmonised dataset used by Cardoso et al. (2010), the Italian dataset contains a richer set of information and a larger sample of siblings in the age range of interest. Using these data, we are able to identify whether there was a short-run imitation effect.

All of the studies on intergenerational transmission share the methodological problem of how to separate “nurture” from “nature”; i.e., how to isolate the effect of the parents' variable of interest on the children's variable from that of a more general family effect, including common genetic traits between parents and children. This problem has been solved in different ways: Loureiro et al. (2006) and Brown et al. (2010) used

instrumental variables, Akee et al. (2010), Black et al. (2005) and Holmlund et al. (2011) used a difference-in-differences approach when changes and reforms occurred. Other authors have exploited datasets in which either twins or adopted children are present to use a fixed-effects approach. The presence in a dataset of individuals who share the same genetic traits but who live in different families (for example, the children of twins, as in Behrman and Rosenzweig 2002, and in Pronzato 2012), or who have a common family background but did not receive the same genetic transmission (for example, natural and adopted children, as in Plug 2004); or, finally, individuals for whom information is available for both natural and adoptive parents (as in Bjorklund et al. 2006) allows for a disaggregation of the effects of genetic transmission from the effects of the family environment.

In our dataset, the number of twins is too small to allow us to distinguish the effects of nature from the effects of nurture. However, by exploiting the presence of a large number of siblings, we can disentangle the effects of imitation from the overall effects of nature and nurture by comparing the reading decisions of children who saw their parents reading with those of their siblings who were not exposed to the same parental example.

In our dataset we only have information on a single day. However, our sample excludes households that completed the diary on a non-standard day, as the literature on habits emphasises that most actions performed on a standard day are characterised by habitual repetition (Neal et al. 2006). We therefore believe that if the parents were reading on the survey day, it is likely that they were reading during the rest of the week as well.<sup>2</sup> Moreover, if the parents were reading where their children could see them on the survey day, they likely did so on other days as well. If an imitation effect exists, the repetition of an imitated behaviour can produce a habit in a child.

### **3 Sample selection and definition of time use variables**

Our analysis of the reading activities builds on two pooled waves (2002–2003 and 2008–2009) of the Time Use Survey conducted by ISTAT. The survey covers 39,325 households (21,075 in the 2002–2003 wave and 18,250 in the 2008–2009 wave) and reports information on each household member.

An individual questionnaire containing socio-demographic information and a time diary were collected. All of the household members over age three completed the time diary on a selected day.<sup>3</sup> In each municipality covered by the survey, households were divided into three groups, and each group was asked to fill in the daily diary on a different day: a weekday, Saturday, or Sunday.<sup>4</sup> Our analysis is based on diaries completed on both weekdays and weekend days. We selected a sample of children ranging in age from 6 to 15<sup>5</sup> who had at least one sibling in the same age range and were living in a household in which both parents were present.<sup>6</sup> We excluded households in which any of the members (children, siblings, or parents) filled in the diary on a “special” day (for example, a day on which they, their siblings, or their parents were ill) and those for whom either a parent or any siblings in the relevant age bracket failed to complete the diary. We also excluded all

of the children for whom one or more variables used in the econometric analysis of Sect. 4 were missing. Our final sample consists of 2740 children (1427 from the first wave and 1313 from the second one) belonging to 1296 households (681 from the 2002–2003 wave and 612 from the 2008–2009 wave).<sup>7</sup>

The diary reports the time spent on a large number of tasks. The activities were coded by the respondent as main or secondary activities.<sup>8</sup> Information about where, when, and with whom the activities were performed was crucial for defining the content of the reading activities for children and parents as follows:

- *For the child*: time spent reading on her or his own, with no adult taking part in the activity, declared as the primary activity;
- *For the parents*: time spent reading, or talking or reading<sup>9</sup> to the child's siblings, in the presence of the child, when the latter was not sleeping, declared either as a primary or a secondary activity.<sup>10</sup>

Table 1 reports the basic descriptives of the allocation of time to reading activities among our sample. Looking at participation rates on the sample day, we find that about 17 % of the mothers and 14 % of the fathers were engaged in reading while their children were observing them. Only about 8 % of the children reported reading. There are a number of reasons for these low values. First, because of the way the time use information was collected, only episodes lasting more than 10 min were recorded. Second, we excluded homework and all of the reading activities done at school (23 % of our children spent more than 5 h at school on the survey day). Finally, because we considered only the reading activities of parents in the presence of the child, the time spent by family members in the same place (typically home) was reduced by the number of hours the child was at school. The corresponding observed unconditional average times (including the observations with reading time equal to zero) were also very low, especially for the parents: about 6 min for mothers and 4 min for fathers and children. The figures increased considerably when we evaluated them on the subsamples of readers: conditional on engaging in the reading activity (bottom part of Table 1) both parents spent an average of about half an hour reading, and the children spent about 50 min reading.



**Table 1 Reading activity of children and of parents in the presence of their children**

	Child	Mother <sup>a</sup>	Father <sup>a</sup>
Participation rates (%)			
Mean	8.39	16.97	13.73
SD	27.73	37.55	34.43
Median	0	0	0
Obs	2740	1296	1296
Reading time (min)—unconditional			
Mean	4.47	5.59	4.1
SD	19.52	22.30	16.59
Median	0	0	0
Obs	2740	1296	1296
Reading time (min)—conditional on reading			
Mean	53.35	32.95	29.88
SD	44.04	45.13	35.2
Median	40	15	20
Obs	230	220	178

Source: Time use 2002–2008, Istat

<sup>a</sup>In the presence of one of their children

#### 4 Empirical strategy

Models of time allocation view an individual's decision about how to spend his or her time as a result of a maximising process in which he or she has to allocate his or her time between competing activities, subject to constraints (typically budget and time constraints). Children allocate their time among school activities, studying and reading at home, relaxation activities (e.g., playing, watching TV, or participating in sports), and activities related to personal care. How they allocate their time depends on their preferences and constraints, including parental control over their time allocation. An empirical model of time allocation should consider a set of simultaneous or sequential equations, one for each activity, depending on all of the personal and family characteristics which may affect the choice. Sequential equations are used when the amount of time the individual chooses to devote to a given activity directly affects the allocation of time to other activities (as in Mancini and Pasqua 2012).

An overview of children's allocation of time among different free time activities is displayed in the first column of Table 5 in the appendix (we comment on the following columns later). We can see that, on average, children spent very little time reading (4.5 min per day), and much more time watching TV and playing (109 min), doing homework (67 min), and participating in sports (41 min).

In our econometric exercise, we do not consider a full model of time allocation, but instead we limit our attention to reading, focusing on the effect of the parents' example on the child's autonomous choice as a result of parental imitation. As a consequence, in our specification we will only insert the variables which

may affect the child's decision to read, such as the child's characteristics (age, gender, birth order, health status). We will also control for the time children spent at school, since we do not model reading during school hours.

We identify the causal impact of the example set by the parents by means of a household fixed effects model which exploits sibling variations in the exposure to the treatment; i.e., the observation of parental reading behaviour.

The adoption of a household fixed effects approach to identify imitation allows us to account for all of the factors affecting the reading behaviour which are shared by siblings within the same family. Notice that this empirical strategy is not suitable for modelling other competing activities which are mainly family activities, such as watching TV.<sup>11</sup> However, these are captured by the household fixed effect.

Participation rather than the amount of time spent reading (duration) was chosen as the relevant time use variable. This choice was motivated by the large number of zero values highlighted in the previous section, which rules out any meaningful modelling of the amount of time devoted to reading activities through either tobit or double-hurdle specifications. Because of the way time use was collected in our data, participation captures the event of reading for at least 10 min, and also conveys some information regarding the duration of the activity. This definition of participation makes it an adequate measure of both the example set by the parents, and the behaviour compatible with the formation of children's reading habits.

Since we are interested in the imitation effect, we only consider children's reading episodes which occurred after they saw their parents reading. The dependent variable, called *child\_reading\_after<sub>ij</sub>*, is a binary measure indicating whether child *i* in household *j* engaged in reading after watching her or his parent reading. The treatment variable we rely on to prove the existence of an intergenerational transmission through imitation is a child-specific measure of parental reading activity which occurred in the presence of each child, called *parent\_reading<sub>ij</sub>*. The latter measure is child-specific because the child's siblings may or may not have seen their parents reading on the survey day. The useful cases for identification come from families in which the parents were seen reading by at least one—but not by all—of their children. In these families, we restrict the observation period for all of the siblings from the first moment the parent was seen reading by one child until the end of the day.

The probability that the child would read increased sharply when he or she was exposed to an example set by either parent, mother or father.

In Table 2(a) we cross-tabulate the observed reading activity of children after the reading activity of their parents for the sample of all children (*Full sample*).<sup>12</sup> From these simple descriptive statistics we observe a strong increase in the sample frequencies of children who read when we condition on the reading activity of either parent. Table 2(a) shows that only 3.7 % (5.3 %) of children whose mother (or father) did not read

engaged in reading behavior, but this figure was 30.4 % (27.7 %) among children whose mother (or father) read.

**Table 2 Sample distribution of child's reading activity after having observed parental reading activity**

	Not reading	Reading	Obs
(a) Full sample			
Mother			
Child does not read after	2176	334	2510
%	96.3	69.6	91.6
Child reads after	84	146	230
%	3.7	30.4	8.4
Obs (number of children)	2260	480	2740
%	100	100	100
Father			
Child does not read after	2234	276	2510
%	94.7	72.3	91.6
Child reads after	124	106	230
%	5.3	27.7	8.4
Obs (number of children)	2358	382	2740
%	100	100	100
(b) Full sample—younger children (6–10)			
Mother			
Child does not read after	1261	98	1359
%	97.4	66.2	94.2
Child reads after	33	50	83
%	2.6	33.8	5.8
Obs (number of children)	1294	148	1442
%	100	100	100
Father			
Child does not read after	1285	75	1360
%	96.2	70.8	94.3
Child reads after	51	31	82
%	3.8	29.2	5.7
Obs (number of children)	1336	106	1442
%	100	100	100
(c) Full sample—older children (11–15)			
Mother			
Child does not read after	1092	92	1184
%	94.5	64.3	91.2
Child reads after	63	51	114
%	5.5	35.7	8.8
Obs (number of children)	1155	143	1298
%	100	100	100
Father			

	Not reading	Reading	Obs
Child does not read after	1095	86	1181
%	93.3	69.4	91.0
Child reads after	79	38	117
%	6.7	30.6	9.0
Obs (number of children)	1174	124	1298
%	100	100	100

Source: Time use 2002–2008, Istat

Table 2(b) and (c) show that the increase in the probability of reading after having seen the mother reading was similar among children in primary school age (ages 6–10) and among children in middle and high school (ages 11–15). Among children who saw the father rather than the mother reading, the increase was only slightly lower among the older children.

Our identification strategy relies on within-family variability. In Table 3 we present the same cross-tabulation as in Table 2, restricted to what we define as the *fixed effects samples*. We have 369 children in families in which within-siblings variation in exposure to parental reading was only through the mother (*mother fixed effects* sample), and 295 children in families in which the variation in exposure occurred only through the father (*father fixed effects* sample). Our finding that the association between reading by children and by parents in the more restrictive fixed effects sample is very similar to the association already found in Table 2(a) suggests that this association is not an artefact of the household fixed effects methodology, which selects in the sample only households in which there is sibling variation in exposure to parental reading. This provides very strong preliminary descriptive evidence of the existence of the imitation effect we want to estimate.

**Table 3 Sample distribution of child's reading activity after having observed parental reading activity—fixed effects samples**

	Not reading	Reading	Obs
<b>Mother</b>			
Child does not read	177	111	288
%	93.7	61.7	78.0
Child reads	12	69	81
%	6.3	38.3	22.0
Obs	189	180	369
<b>Father</b>			
Child does not read	146	100	246
%	96.1	69.9	83.4
Child reads	6	43	49
%	3.9	30.1	16.6
Obs	152	143	295

Source: Time use 2002–2008, Istat

In columns 2–5 of Table 5 in the Appendix 1, we show the time (in minutes) dedicated to competing free time activities split by treated and non-treated children in the mother and the father fixed effects samples, respectively. For both samples, the increase in the amount of time devoted to reading is sizeable and significant when the child had been exposed to parental reading, which confirms the high association shown in the above Table 3. Of particular interest to us is the finding that there were no statistical differences in the amount of time devoted to competing activities between treated and non-treated children for both parents, with the only exception being the category of play. This seems to suggest that children who observed their mother or father reading substituted time they might have spent playing with time spent reading, while allocating roughly the same amount of time to other free time activities. Moreover, the fact that the average amount of time spent on outdoor activities such as sports were similar across treated and non-treated children supports the assumption of the exogeneity of exposure to parental reading. Indeed, if the children who observed their parents reading were among those who already had a preference for reading and therefore for spending more time at home, we probably would have found that they spent less time participating in sports.<sup>13</sup>

In order to account for unobserved heterogeneity at the household level, the estimation is performed with a household fixed-effects linear model explaining the probability that child  $i$  in family  $j$  engages in reading after observing her or his parent reading:

$$child\_reading\_after_{ij} = \gamma_0 + \gamma_1 parent\_reading_{ij} + \gamma_2 Z_i + \mu_j + \epsilon_{ij}.$$

The parameter  $\gamma_1$  captures the short-run imitation effect (the parents' example), and can be estimated net of the whole set of unobservable confounders at the family level ( $\mu_j$ ). These confounders include unobserved environmental and genetic factors which influence both the parents' and the children's preferences regarding reading, parental attitudes (such as pressure to read placed on the children by the parents), and the parents' educational messages regarding the importance of reading (the parents' sermon). Moreover, this household fixed effect captures all of the day-specific factors to which siblings were exposed in the sampled day (e.g., weather conditions which may have influenced the reading behavior, or particular events such as a big television show that everybody in the family wanted to watch).

We also control for a number of exogenous observable child characteristics ( $Z_i$ ). The child's age is proxied through a dummy equal to one if the child was attending middle or high school (*middle/high school*), since in terms of differences in time use and school habits the major change comes at the transition from primary to middle school (and to a lesser extent at middle to high school). We allow the imitation effect to vary according to the school level by interacting this dummy and the parents' reading time. The gender dummy *girl* captures possible systematic differences in time use habits linked to the gender of the child. This dummy is interacted with parents' reading time to account for differences in the transmission of time use habits from parents to children related to the gender of the child. We also control for child's birth order (dummies *birth*

*order: second and birth order: third or more*), for the time spent at school by the child (dummy *more than 5 h at school*) and for the self-reported *general health status* of the child.<sup>14</sup>

In Table 7 in the Appendix 1 we present the summary statistics of the regressors used in the empirical analysis, splitting the sample into “treated” and “untreated” children, whereby the former group are those exposed to the mother/father example. In most cases, the averages do not statistically differ by treatment status. This is not true for gender, school level, and one of the birth order indicators, which confirms the importance of including these variables as controls. We have also built two indicators of child’s preferences for *non-physical activities* (which are typically performed at home) and for spending time *outdoors*<sup>15</sup> which we will use to perform a robustness check of our main specification. It is worth noting that the child’s preference variables are not statistically different among treated and not treated children. The marginal significance of the variable measuring “time spent at home” for the mother fixed effect sample is given particular attention. Since this is a choice variable, we do not insert it in our main specification, but we will check that the estimated imitation effect is robust to its inclusion.

## 5 Results

### 5.1 Estimated imitation effects

We report in Table 4 the estimated intergenerational coefficients capturing the causal effect of the parent’s example,<sup>16</sup> which are found to be significant and of considerable magnitude. In the next section, we corroborate this finding with several robustness checks.

**Table 4 Estimated imitation effect: linear probability model, family fixed effects**

Dependent variable: *child\_reading\_after* (= 1 if child reads after observing the parent reading)  
 Treatment variables: *mother\_reading* (= 1 if the mother is observed reading by the child)  
*father\_reading* (= 1 if the father is observed reading by the child)

Variables	(1)	(2)		(3)	
	Raw (FE)	Child (FE)		Inter (FE)	
<i>Reference Prob (child_reading_after = 1)<sup>a</sup></i>	0.040	0.039		0.038	
<i>Mother_reading</i>	0.302*** (0.055)	0.302*** (0.055)		0.297*** (0.078)	
<i>Mother_reading</i> × Wave 2008	0.025 (0.081)	0.021 (0.081)		0.021 (0.082)	
Middle/High school		0.002 (0.017)		0.003 (0.016)	
Girl		0.000 (0.012)		−0.002 (0.012)	
<i>Mother_reading</i> × middle/high school				−0.011 (0.063)	
<i>Mother_reading</i> × Girl				0.019 (0.065)	
<i>Reference Prob (child_reading_after = 1)<sup>b</sup></i>	0.046	0.050		0.047	
<i>Father_reading</i>	0.314*** (0.056)	0.311*** (0.055)		0.316*** (0.071)	
<i>Father_reading</i> × Wave 2008	−0.096 (0.082)	−0.096 (0.082)		−0.105 (0.082)	
Middle/High school		−0.007 (0.017)		−0.003 (0.017)	
Girl		0.019 (0.013)		0.013 (0.013)	
<i>Father_reading</i> × Middle/High school				−0.056 (0.061)	
<i>Father_reading</i> × Girl				0.063 (0.063)	
<i>Reference Prob (child_reading_after = 1)<sup>a</sup></i>	0.047	0.050		0.05	
<i>Reference Prob (child_reading_after = 1)<sup>b</sup></i>	0.054	0.058		0.054	
<i>Mother_reading</i>	0.239*** (0.065)	0.241*** (0.065)		0.216** (0.088)	
<i>Mother_reading</i> × Wave 2008	0.079 (0.095)	0.075 (0.094)		0.074 (0.095)	
<i>Father_reading</i>	0.220*** (0.069)	0.217*** (0.068)		0.258*** (0.088)	
<i>Father_reading</i> × Wave 2008	−0.098 (0.098)	−0.096 (0.098)		−0.103 (0.098)	
Middle/High school		−0.007 (0.016)		−0.001 (0.015)	
Girl		0.003 (0.012)		−0.003 (0.011)	
<i>Mother_reading</i> × Middle/High school				−0.008 (0.076)	
<i>Mother_reading</i> × Girl				0.051 (0.082)	
<i>Father_reading</i> × Middle/High school				−0.060 (0.085)	
<i>Father_reading</i> × Girl				−0.002 (0.085)	

Columns 2 and 3 include as controls: birth order, child health, time spent at school. Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional to *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional to *father\_reading* = 0

We look at three separate specifications, including the following regressors: a) an indicator for the mother's reading activity (upper part of the table), b) an indicator for the father's reading activity (central part of the table), and c) two separate indicators for the reading activities of the mother and the father (lower part of the

table). For each of these three specifications, we start by inserting no control (first column, labeled “Raw FE”). We then condition on the child’s characteristics  $X$  (second column, labeled “Child (FE)”), and, finally, we extend the specification to the interactions of parental time with child gender and the school level dummy (third column, labeled “Inter (FE)”).

We take column (2) as the preferred specification, since interactions of the variable of the mother’s time spent reading with the child’s school level turn out not to be significant.<sup>17</sup> Having observed the mother reading raises the estimated reading probability from about 4 % (reference probability) to about 34 %. Direct imitation of the father alone leads to a similar increase in the probability that a child would have read: from about 5 % if the child did not observe the father reading, to about 36 % if the child did. In the bottom part of Table 4 we show that the imitation effect remains significant and large when we disentangle the effect of each parent, and evaluate the effect of imitating the mother (father) while controlling for the possible imitation of the father (mother). The imitation effect of the mother, net of the exposure to the father’s example, leads to an increase in the probability of the child reading from about 5 % to about 29 %; i.e., the probability is almost six times bigger. The imitation effect of the father turns out to be very similar: the probability of the child reading after observing the father reading increased from about 6 % to about 28 %. In Tables 8, 9 and 10 in Appendix 2 we report the full estimation results.

## 5.2 Robustness exercises

In this sub-section we provide evidence supporting our identification strategy and validating our findings on the existence of an imitation effect. The detailed outputs are contained in Appendix 3.

We start by including in our preferred specification (column 2 of Table 4) two indicators of the child’s preferences for physical and outdoors activities. Sibling variation in exposure to the parents’ example could be correlated to individual unobserved determinants of the reading patterns, such as preferences. By controlling for these determinants, we reduce the risk of overestimating the imitation effect. In Table 11 we report the results showing that the child’s preference variables are hardly significant for either specification (mother and father) and that their inclusion does not affect the estimated imitation effect.

Next, we show that the relationship between reading and witnessing the parent reading is not spurious. It is worth remembering that although reading activity was recorded wherever it occurred, most of it took place at home for both the parents and the children. If we assume that a child’s presence at home explains both her or his reading activity and her or his witnessing of the parent’s reading, our estimated imitation effect could just be capturing some “presence at home” factors. In Table [12](#) we therefore control for both the time spent at school (as in the main regression) and the time spent at home by the child. We do not observe a decreased imitation coefficient, as we would expect to find if there was a spurious correlation induced by presence at home.



We also perform some sensitivity analysis on the sample selection criteria. We run the estimation on two new samples to ensure that our sample selection requirement (that both parents completed the daily diary) does not produce biased results. In the first sample, we include all child/mother pairs for whom we have the time diaries, and in this sample we test the mother's estimates. In the second sample, we do the same for the child/father pairs. The results remain the same, with only marginal changes in the coefficients (see Table 13).

Next, we repeat our estimation by controlling for the possibility that the child was reading *before* she or he saw either parent reading. The aim of this exercise is to make sure we are isolating a short-run imitation effect, and are not just capturing other mechanisms. Table 14 shows that the main coefficients associated with the parents' reading activities remain sizeable and significant, albeit smaller than the corresponding figures obtained above. This confirms that a substantial component of our estimated effect is indeed imitation.

In Table 15 we show that our results are not driven by the miscellaneous "talking or reading to the children" category included in the definition of the reading activity of parents. While excluding this category certainly reduces the number of useful cases for identification, the imitation effect is substantially confirmed.

Finally, we address the fact that the observation window for the child varies with the reading activity of the parent, and it is equal to the whole day if the parent did not read. Since the observation period is larger for children who did not observe the reading activity of the parent, this makes it more likely that we would observe reading activity among children who did not imitate their parents. This implies that the estimated imitation coefficient is attenuated. Nevertheless, in Table 16 we display the results of an alternative identification strategy, based on the same observation windows for all children. Here we fix different points in time (4.30 pm, 5.30 pm, 6.30 pm) before which the parents either were or were not seen reading by their children, while the behaviour of the children is observed after that point in time (we allow activity to overlap for a 30-min span). This strategy is much more stringent than the one used to derive the main results presented above. Interestingly, we still see significant imitation effects, with the magnitude varying across the cases considered.

## 6 Conclusions

In the current study, we took advantage of the presence of households with more than one child in the Italian time use dataset to explore the mechanisms of the intergenerational transmission of preferences for human capital building activities, such as reading, between parents and their children aged 6–15. In particular, we investigated whether children were more likely to have spent time reading after they observed their parents reading on the day of the survey (short-run imitation effect).

In our identification strategy, the estimated intergenerational coefficient captured the causal effect of the parents' example. We found new evidence of a short-run imitation effect: children are much more likely to

read after seeing their parents reading. If the mother was reading, the probability of the child reading increased from about 4 % to about 34 %. If the father was reading, the probability of the child reading increased from about 5 % to about 36 %.

As these results are based on a family fixed-effects approach, they disentangle the lessons the parents taught by example (which may have been experienced differently by the siblings of the same family on the survey day) from the lessons the parents imparted directly (the unobserved educational attitudes of the parents, which would have been shared by the siblings).

Since the children were found to have imitated the behaviours they observed in their parents, our results corroborate the saying that “a good example is the best sermon”. We therefore conclude that parents’ time use may affect their children’s behaviour and time allocation decisions, and thus the future outcomes of their children.

Our results shed new light on the mechanisms of intergenerational transmission of preferences and attitudes that are essential for targeting human capital accumulation policies. The imitation mechanism could be particularly important for children with less educated parents, who are less likely to encourage their children to read, but who might act as an example by reading while at home. Further research is needed to study the imitation of both “positive” behaviours, like socializing, engaging in physical activities, and healthy eating;<sup>18</sup> and “negative” behaviours, like smoking and alcohol consumption, watching TV, and being violent.

If it is true that parents influence children’s actions by their example, more attention should be paid to adults’ habits. Programmes for parents may contribute to improving children’s life course trajectories and to reducing the health and developmental problems that are associated with higher costs for the government and for society as a whole.

## Footnotes

1 See, for example, Anger and Heineck (2010), Ermisch and Francesconi (2001), Loureiro et al. (2006), Bjorklund et al. (2006), Farré et al. (2012), Mullan (2010) and Dohmen et al. (2012).

2 We derived some evidence on the relation between reading activities across days using a similar sample of siblings aged 6–15 drawn from the Child Development Supplement of the Panel Study of Income Dynamics in year 2002, where, for each child, time diaries are available for two days: a weekday and a weekend day. We estimated a very strong correlation between the child’s reading activity in weekend days and their reading activity in weekdays, which kept sizeable and significant even after controlling for household unobserved heterogeneity.

3 Parents completed the time diaries of children below the age of six, but these very young children were not included in our sample. It is also likely that parents helped the youngest children of our sample to fill in the diary, but no information on this issue is provided in the dataset.

4 The oversampling of weekend diaries was a deliberate choice of the data collector.

5 Given our focus on activities children can do on their own, we excluded very young children from our sample because it is highly likely that all of their reading activities were done together with their parents.

6 Households with only one child between ages 6 and 15 were therefore excluded. This is one of the main reasons why the number of families in our sample was much smaller than the original number..

7 Our final sample is dramatically reduced with respect to the original dataset. We started with 32,448 children, but this number was reduced to 9710 because of our age selection. In addition, 2704 observations were dropped because a family member did not fill in the time diary, because the time diary was filled in on a non-standard day (such as a holiday or a sick day) or because the relevant variables were missing. As we wanted only children with at least one sibling in the relevant age bracket, our sample shrank to 2740. We checked that the sample of households with at least two children ages 6-15 did not systematically differ from the sample we selected for our analysis..

8 For example, someone may have been cooking and watching television or cooking and looking after the children. In these cases, the respondent chose which of the activities was the main one and which was the secondary one.

9 “Talking or reading to...” is a unique category in the dataset from which we cannot separate out the talking component.

10 Notice that for the children we consider reading only when it was the primary activity. For parents, we also consider reading when it was declared as being a secondary activity, as we did not want to exclude those situations in which a parent was, for example, listening to music (primary activity) while reading.

11 Descriptive evidence supporting the view that TV watching is a family activity is available upon request.

12 For families in which the parents did not read at all in the presence of their children, we look at the reading activity of the child over the whole day. This implies that the observational period for children in families in which one of the parents was observed reading in the sampled day is shorter.

13 In Table 6 we describe instead the participation rates of different free time children activities, disentangling those that are contemporaneous to parental reading episodes observed by children. The table reveals that children are more likely to read during parental reading episodes with respect to moments in which they are not exposed to parental reading. It can also be noted that participation rates into playing, homework and TV watching are quite high irrespectively of parental activities, testifying that the choice set available to children is quite ample both when they are exposed and not exposed to parental example.

14 In our data the health status is a categorical variable that ranges from one (excellent health status) to five (very bad health status).

15 The survey questionnaire asked the children if they would like to engage more or less (or if they are satisfied with their engagement) in several typical child activities. For each item we created a dummy equal to one if the child wanted to spend more time on that activity. We then created two indicators that capture the preferences regarding non-physical activities and outdoor activities by grouping, and summed up the corresponding dummies. The activities included in 2002 and 2008 are coded differently, and in 2008 a residual category “other” was also introduced. For 2002 the non-physical activities we consider are homework, computer courses, language courses and theatre, dance, or music; and we assume that for physical activities children had to spend time outdoors and playing outdoors (as opposed to playing inside). For 2008 the non-physical activities we consider are homework and general cultural activities (like theater, dance, or music), while the physical activities are identified only by “preferring to play outdoors” (as opposed to playing inside).

16 In the longer version of the paper (Mancini et al. 2011) we estimated the intergenerational association in reading habits without distinguishing between “sermon” and “example” (“long run” model). We found a positive association between the parents’ and the children’s reading habits that was stronger for the mother. This association persisted and remained sizable even after controlling for a set of observable child and family characteristics. Despite the conditioning on a large set of covariates, this positive association was not likely to capture the causal effect of the role model played by parents.

17 This seems to suggest the absence of heterogeneous imitation coefficients across age groups, conditional on an additive unobserved household fixed effect. Unfortunately, we do not have enough power to allow for heterogeneity in both the imitation coefficient and the household fixed effect, as this would require a separate fixed effects estimation on appropriate subsamples.

18 Many studies have found that parental obesity explains overweight among children (Whitaker et al. 1997).

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## Appendix 1

Tables 5, 6, and 7.

**Table 5 Sample average of time spent (minutes) in free time activities by treatment status in the full sample and in the mother and father fixed-effects samples**

Treated = having observed the mother/father reading ( <i>parent_reading = 1</i> )											
Variables		Full sample		Mother FE sample				Father FE sample			
				Non treated		Treated		Non treated		Treated	
Reading	Primary	4.5	(19.52)	3.4	(13.01)	25.5***	(43.82)	3.8	(17.53)	22.7***	(34.02)
Homework	Primary	67.7	(70.25)	61.8	(68.39)	57.9	(68.39)	65.1	(71.58)	65.4	(71.80)
Cultural activities	Primary	5.5	(28.02)	6.9	(30.42)	7.9	(33.97)	2.9	(18.00)	4.5	(22.85)
Sport	Primary	41.1	(68.56)	38.0	(64.98)	37.1	(60.23)	47.4	(65.11)	48.1	(65.95)
Play	Primary	109.9	(114.2)	131.1	(115.1)	107.9**	(106.3)	121.8	(115.3)	101.3	(96.98)
Watching TV	Primary	109.1	(85.25)	101.3	(78.48)	101.7	(76.92)	105.9	(88.14)	107.0	(83.09)
Internet	Primary	3.7	(19.34)	2.9	(18.58)	3.9	(16.53)	5.0	(24.09)	6.6	(21.95)
Number of observations		2740		189		180		152		143	

Standard deviations in parentheses

\* \*\* \* t test for the difference of means across treated and untreated groups significant at 10, 5, 1 % level

**Table 6 Participation rates (%) of free time activities by observation of parent reading at the same time: parent reading (observed) versus all other parent's activities**

		Mother activity		Father activity	
		Other	Reading (observed)	Other	Reading (observed)
Reading	Primary	1.70 (0.10)	3.30 (0.30)	1.70 (0.10)	3.10 (0.30)
Homework	Primary	14.70 (0.20)	18.00 (0.70)	14.70 (0.20)	17.20 (0.80)
Cultural activities	Primary	1.50 (0.00)	0.20 (0.10)	1.50 (0.10)	0.30 (0.10)
Sport	Primary	11.80 (0.10)	2.70 (0.30)	11.80 (0.10)	2.60 (0.30)
Play	Primary	34.30 (0.20)	34.60 (0.90)	34.30 (0.20)	35.60 (1.00)
Watching TV	Primary	34.50 (0.20)	39.10 (0.90)	34.50 (0.20)	39.60 (1.00)
Internet	Primary	1.60 (0.10)	1.80 (0.20)	1.60 (0.10)	1.70 (0.20)

Standard deviations in parentheses

**Table 7 Sample average of regressors by treatment status in the full sample and in the mother and father fixed-effects samples**

<b>Treated = having observed the mother/father reading (<i>parent_reading</i> = 1)</b>										
<b>Variables<sup>a</sup></b>	<b>Full sample</b>		<b>Mother FE sample</b>				<b>Father FE sample</b>			
			<b>Non treated</b>		<b>Treated</b>		<b>Non treated</b>		<b>Treated</b>	
Middle/High school	0.474	(0.499)	0.439	(0.498)	0.528*	(0.501)	0.454	(0.500)	0.601**	(0.491)
Girl	0.480	(0.500)	0.471	(0.500)	0.578**	(0.495)	0.467	(0.501)	0.524	(0.501)
Birth order: first	0.411	(0.492)	0.370	(0.484)	0.444	(0.498)	0.368	(0.484)	0.469*	(0.501)
Birth order: second	0.459	(0.498)	0.434	(0.497)	0.428	(0.496)	0.454	(0.500)	0.420	(0.495)
Birth order: third or more	0.129	(0.335)	0.196	(0.398)	0.128	(0.335)	0.178	(0.383)	0.112	(0.316)
General health status	1.500	(0.568)	1.524	(0.561)	1.528	(0.655)	1.513	(0.552)	1.490	(0.638)
Child's time at home (h)	7.60	(2.66)	7.70	(2.51)	8.28**	(2.72)	8.07	(2.76)	8.80	(2.85)
More than 5 h at school	0.222	(0.416)	0.228	(0.420)	0.189	(0.393)	0.204	(0.404)	0.175	(0.381)
Non-physical activities	0.630	(0.483)	0.693	(0.462)	0.672	(0.471)	0.664	(0.474)	0.678	(0.469)
Outdoor	0.231	(0.422)	0.243	(0.430)	0.244	(0.431)	0.263	(0.442)	0.259	(0.439)
Wave 2008	0.479	(0.500)	0.434	(0.497)	0.478	(0.501)	0.474	(0.501)	0.483	(0.501)
Number of observations	2740		189		180		152		143	

Standard deviations in parentheses

\* \*\* \*\*\* *t* test for the difference of means across treated and untreated groups significant at 10, 5, 1 level<sup>a</sup>The variables are described in Sect. 4

## Appendix 2

Tables 8, 9 and 10.

**Table 8 Estimated imitation effect: linear probability model, family fixed effects—mother**

<b>Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)</b>									
<b>Treatment variable: <i>mother_reading</i> (=1 if the mother is observed reading by the child)</b>									
<b>Variables</b>	<b>(1)</b>		<b>(2)</b>		<b>(3)</b>		<b>(4)</b>		
	<b>FE raw</b>		<b>FE child</b>		<b>OLS (FE sample)</b>		<b>FE inter</b>		
<i>Reference Prob (child_reading_after = 1)</i> <sup>a</sup>	0.04		0.039		0.099		0.038		
<i>Mother_reading</i>	0.302***	(0.055)	0.302***	(0.055)	0.288***	(0.056)	0.297***	(0.078)	
<i>Mother_reading</i> × <i>Wave 2008</i>	0.025	(0.081)	0.021	(0.081)	0.056	(0.078)	0.021	(0.082)	
Middle/High school			0.002	(0.017)	−0.045	(0.049)	0.003	(0.016)	
Girl			0.000	(0.012)	0.028	(0.038)	−0.002	(0.012)	
Birth order: second			−0.022*	(0.013)	−0.096*	(0.051)	−0.023*	(0.013)	
Birth order: third or more			−0.042	(0.027)	−0.093	(0.060)	−0.042	(0.027)	
General health status			0.003	(0.018)	−0.020	(0.031)	0.003	(0.018)	
More than 5 h at school			0.013	(0.021)	−0.020	(0.046)	0.012	(0.021)	
<i>Mother_reading</i> × Middle/High school							−0.011	(0.063)	
<i>Mother_reading</i> × Girl							0.019	(0.065)	
Constant	0.038***	(0.004)	0.047	(0.034)	0.165**	(0.069)	0.046	(0.034)	

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)								
Treatment variable: <i>mother_reading</i> (=1 if the mother is observed reading by the child)								
Variables	(1)		(2)		(3)		(4)	
	FE raw		FE child		OLS (FE sample)		FE inter	
Observations	2740		2740		369		2740	
R <sup>2</sup>	0.107		0.113		0.163		0.113	
Number of families	1296		1296				1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional to *mother\_reading* = 0

**Table 9 Estimated imitation effect: linear probability model, family fixed effects—father**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)								
Treatment variable: <i>father_reading</i> (=1 if the father is observed reading by the child)								
Variables	(1)		(2)		(3)		(4)	
	FE raw		FE child		OLS (FE sample)		FE inter	
<i>Reference Prob (child_reading_after = 1)</i> <sup>a</sup>	0.046		0.05		0.047		0.047	
Father_reading	0.314***	(0.056)	0.311***	(0.055)	0.274***	(0.056)	0.316***	(0.071)
Father_reading × Wave 2008	−0.096	(0.082)	−0.096	(0.082)	−0.023	(0.078)	−0.105	(0.082)
Middle/High school			−0.007	(0.017)	−0.032	(0.049)	−0.003	(0.017)
Girl			0.019	(0.013)	−0.003	(0.041)	0.013	(0.013)
Birth order: second			−0.026**	(0.013)	−0.060	(0.053)	−0.027**	(0.013)
Birth order: third or more			−0.064**	(0.025)	−0.049	(0.072)	−0.065**	(0.025)
General health status			−0.013	(0.019)	0.011	(0.036)	−0.011	(0.019)
More than 5 h at school			0.014	(0.019)	0.052	(0.053)	0.014	(0.019)
Father_reading × Middle/High school							−0.056	(0.061)
Father_reading × Girl							0.063	(0.063)
Constant	0.051***	(0.003)	0.082**	(0.035)	0.064	(0.082)	0.081**	(0.035)
Observations	2740		2740		295		2740	
R <sup>2</sup>	0.068		0.077		0.130		0.080	
Number of families	1296		1296				1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional to *father\_reading* = 0

**Table 10 Estimated imitation effect: linear probability model, family fixed effects—mother and father**

Dependent variable: <i>child_reading_after</i> (= 1 if child reads after observing the parent reading)								
Treatment variable: <i>mother_reading</i> (= 1 if the mother is observed reading by the child)								
<i>father_reading</i> (= 1 if the father is observed reading by the child)								
Variables	(1)		(2)		(3)		(4)	
	FE raw		FE child		OLS (FE sample)		FE inter	
Reference Prob ( <i>child_reading</i> = 1) <sup>a</sup>	0.047		0.05		0.127		0.05	
Reference Prob ( <i>child_reading</i> = 1) <sup>b</sup>	0.054		0.058		0.185		0.054	
Mother_reading	0.239***	(0.065)	0.241***	(0.065)	0.263***	(0.064)	0.216**	(0.088)
Mother_reading × Wave 2008	0.079	(0.095)	0.075	(0.094)	0.065	(0.091)	0.074	(0.095)
Father_reading	0.220***	(0.069)	0.217***	(0.068)	0.129*	(0.068)	0.258***	(0.088)
Father_reading × Wave 2008	−0.098	(0.098)	−0.096	(0.098)	0.021	(0.096)	−0.103	(0.098)
Middle/High school			−0.007	(0.016)	−0.032	(0.043)	−0.001	(0.015)
Girl			0.003	(0.012)	0.003	(0.033)	−0.003	(0.011)
Birth order: second			−0.022*	(0.012)	−0.040	(0.045)	−0.023*	(0.012)
Birth order: third or more			−0.051**	(0.025)	−0.025	(0.055)	−0.051**	(0.025)
General health status			−0.005	(0.017)	0.009	(0.030)	−0.003	(0.017)
More than 5 h at school			0.015	(0.018)	0.013	(0.040)	0.012	(0.018)
Mother_reading × Middle/High school							−0.008	(0.076)
Mother_reading × Girl							0.051	(0.082)
Father_reading × Middle/High school							−0.060	(0.085)
Father_reading × Girl							−0.002	(0.085)
Constant	0.028***	(0.005)	0.052	(0.033)	0.082	(0.064)	0.050	(0.033)
Observations	2740		2740		483		2740	
R <sup>2</sup>	0.156		0.161		0.173		0.163	
Number of families	1296		1296				1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional to *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional to *father\_reading* = 0

### Appendix 3

Tables 11, 12, 13, 14, 15 and 16.

**Table 11 Robustness check: child's preferences. Estimated imitation effect. Linear probability model, family fixed effects**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variable: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
Reference Prob ( <i>child_reading_after</i> = 1)	0.039 <sup>a</sup>		0.049 <sup>b</sup>	
Parent_reading	0.302***	(0.055)	0.311***	(0.055)
Parent_reading × Wave 2008	0.021	(0.081)	−0.097	(0.082)
Middle/High school	0.004	(0.017)	−0.005	(0.017)
Girl	0.002	(0.012)	0.021*	(0.013)
Birth order: second	−0.022*	(0.013)	−0.027**	(0.013)
Birth order: third or more	−0.041	(0.027)	−0.064**	(0.025)
General health	0.003	(0.018)	−0.012	(0.019)
More than 5 h at school	0.013	(0.021)	0.016	(0.020)
Physical activities	−0.010	(0.008)	−0.016*	(0.009)
Outdoor activities	0.007	(0.017)	0.021	(0.018)
Constant	0.046	(0.034)	0.078**	(0.035)
Observations	2740		2740	
R <sup>2</sup>	0.114		0.080	
Number of families	1296		1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional on *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional on *father\_reading* = 0

**Table 12 Robustness check: time spent at home by the child. Estimated imitation effect. Linear probability model, family fixed effects**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variable: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
Reference Prob ( <i>child_reading_after</i> = 1)	0.04 <sup>a</sup>		0.05 <sup>b</sup>	
Parent_reading	0.298***	(0.055)	0.307***	(0.055)
Parent_reading × Wave 2008	0.024	(0.081)	−0.095	(0.082)
Middle/High school	0.001	(0.017)	−0.007	(0.017)
Girl	−0.001	(0.013)	0.018	(0.013)



Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variable: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
Birth order: second	−0.022*	(0.013)	−0.026**	(0.013)
Birth order: third or more	−0.048*	(0.027)	−0.065**	(0.026)
General health status	0.003	(0.018)	−0.013	(0.019)
More than 5 h at school	0.019	(0.021)	0.021	(0.020)
Child's time at home	0.004	(0.004)	0.005	(0.004)
Constant	0.013	(0.047)	0.040	(0.047)
Observations	2740		2740	
R <sup>2</sup>	0.113		0.078	
Number of families	1296		1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional on *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional on *father\_reading* = 0

**Table 13 Robustness check: sample selected on all mother/child pairs and father/child pairs with no missing. Estimated imitation effect. Linear probability model, family fixed effects**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variable: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
<i>Reference Prob (child_reading_after = 1)</i>	0.037 <sup>a</sup>		0.61 <sup>b</sup>	
Parent_reading	0.300***	(0.053)	0.299***	(0.053)
Parent_reading × Wave 2009	0.018	(0.080)	−0.071	(0.079)
Middle/High school	0.006	(0.016)	−0.010	(0.016)
Girl	0.001	(0.012)	0.021*	(0.013)
Birth order: second	−0.022*	(0.012)	−0.028**	(0.013)
Birth order: third or more	−0.039	(0.026)	−0.069***	(0.025)
General health status	−0.003	(0.017)	−0.016	(0.018)
More than 5 h at school	0.008	(0.020)	0.014	(0.019)
Constant	0.054	(0.033)	0.089***	(0.034)
Observations	2908		2830	
R <sup>2</sup>	0.110		0.078	
Number of families	1374		1340	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional on *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional on *father\_reading* = 0

**Table 14 Robustness check: child's previous reading activities. Estimated imitation effect. Linear probability model, family fixed effects**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variable: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
Reference Prob ( <i>child_reading_after</i> = 1)	0.062 <sup>a</sup>		0.068 <sup>b</sup>	
Parent_reading	0.237***	(0.057)	0.252***	(0.067)
Parent_reading*Wave 2008	−0.041	(0.089)	−0.180*	(0.102)
Middle/High school	−0.000	(0.013)	−0.007	(0.012)
Girl	0.000	(0.010)	0.014	(0.009)
Birth order: second	−0.015	(0.010)	−0.015	(0.010)
Birth order: third or more	−0.013	(0.021)	−0.027	(0.020)
General health status	0.004	(0.017)	−0.015	(0.014)
More than 5 h at school	0.011	(0.014)	0.016	(0.015)
Previous reading activity	0.692***	(0.049)	0.732***	(0.043)
Constant	0.016	(0.028)	0.044*	(0.026)
Observations	2740		2740	
R <sup>2</sup>	0.438		0.527	
Number of familes	1296		1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional on *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional on *father\_reading* = 0

**Table 15 Robustness check: parental reading without the category “Talking and reading to the child”. Estimated imitation effect. Linear probability model, family fixed effects**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variables: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
Reference Prob ( <i>child_reading_after</i> = 1)	0.062 <sup>§</sup>		0.068 <sup>#</sup>	
Parent_reading	0.237***	(0.076)	0.256***	(0.064)
Parent_reading* Wave 2008	0.065	(0.121)	−0.048	(0.103)
Middle/High school	−0.001	(0.017)	−0.012	(0.017)
Girl	0.006	(0.013)	0.021	(0.013)
Birth order: second	−0.023*	(0.014)	−0.030**	(0.013)

Dependent variable: <i>child_reading_after</i> (=1 if child reads after observing the parent reading)				
Treatment variables: <i>parent_reading</i> (=1 if the mother/father is observed reading by the child)				
Variables	FE child			
	Mother		Father	
Birth order: third or more	-0.051*	(0.027)	-0.072***	(0.027)
General health status	-0.002	(0.019)	-0.010	(0.020)
More than 5 h at school	0.005	(0.022)	0.018	(0.020)
Constant	0.077**	(0.035)	0.093***	(0.036)
Observations	2740		2740	
R <sup>2</sup>	0.041		0.041	
Number of families	1296		1296	

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional on *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional on *father\_reading* = 0

**Table 16 Alternative estimation strategy: same observation period for all children. Estimated imitation effect. Linear probability model, family fixed effects**

Dependent variable: <i>child_reading_after</i> (=1 if child reads after 4 pm (5 pm) (6 pm))												
Treatment variables: <i>mother_reading</i> (=1 if mother observed reading by the child before 4.30 pm (5.30 pm) (6.30 pm))												
<i>father_reading</i> (=1 if father observed reading by the child before 4.30 pm (5.30 pm) (6.30 pm))												
Variables	4–4.30 pm				5–5.30 pm				6–6.30 pm			
	FE raw		FE child		FE raw		FE child		FE raw		FE child	
<i>Reference Prob</i> ( <i>child_reading_after</i> = 1) <sup>a</sup>	0.05		0.048		0.044		0.045		0.034		0.032	
Mother_reading	0.150* *	(0.06 1)	0.152* *	(0.06 1)	0.116* *	(0.05 2)	0.118* *	(0.05 2)	0.173* **	(0.05 3)	0.176* **	(0.05 3)
Mother_reading × W ave 2008	0.244* **	(0.09 4)	0.240* *		0.193* *	(0.08 9)	0.191* *	(0.08 9)	0.036	(0.08 6)	0.034	(0.08 6)
Middle/High school			0.005	(0.01 5)			−0.003	(0.01 5)			0.001	(0.01 4)
Girl			0.001	(0.01 2)			0.003	(0.01 1)			0.005	(0.01 1)
<i>Reference Prob</i> ( <i>child_reading_after</i> = 1) <sup>b</sup>	0.046		0.044		0.041		0.042		0.037		0.038	
Father_reading	0.292* **	(0.06 6)	0.289* **	(0.06 5)	0.223* **	(0.06 0)	0.221* **	(0.05 9)	0.183* **	(0.05 3)	0.181* **	(0.05 3)
Father_reading × Wa ve 2008	−0.207 **	(0.10 3)	−0.203 **	(0.10 3)	−0.150	(0.09 2)	−0.151 *	(0.09 1)	−0.079	(0.08 6)	−0.076	(0.08 6)
Middle/High school			0.004	(0.01			−0.002	(0.01			0.001	(0.01

Dependent variable: <i>child_reading_after</i> (=1 if child reads after 4 pm (5 pm) (6 pm))												
Treatment variables: <i>mother_reading</i> (=1 if mother observed reading by the child before 4.30 pm (5.30 pm) (6.30 pm))												
<i>father_reading</i> (=1 if father observed reading by the child before 4.30 pm (5.30 pm) (6.30 pm))												
Variables	4–4.30 pm				5–5.30 pm				6–6.30 pm			
	FE raw		FE child		FE raw		FE child		FE raw		FE child	
				6)				5)				4)
Girl			0.005	(0.01 2)			0.006	(0.01 1)			0.010	(0.01 1)

Robust standard errors in parentheses

\*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$

<sup>a</sup>Sample average estimated probability for a young child conditional on *mother\_reading* = 0

<sup>b</sup>Sample average estimated probability for a young child conditional on *father\_reading* = 0

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